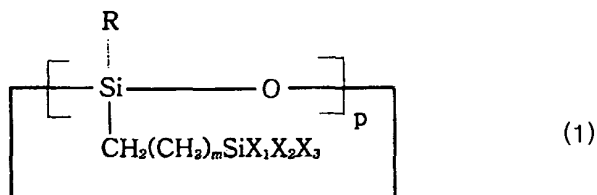


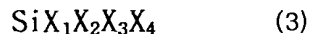
WHAT IS CLAIMED IS:

1. A siloxane-based resin prepared by hydrolyzing and polycondensing a
 5 cyclic siloxane compound of formula (1), together with a silane compound
 of formula (3) and/or a silane compound of formula (4), in an organic
 solvent in the presence of a catalyst and water:



wherein,

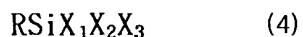
- 10 R is H, C₁₋₃ alkyl, C₃₋₁₀ cycloalkyl, or C₆₋₁₅ aryl;
 each of X₁, X₂, and X₃ is, independently, C₁₋₃ alkyl, C₁₋₁₀ alkoxy, or halo,
 provided that at least one is alkoxy or halo;
 p is an integer from 3 to 8; and
 m is an integer from 1 to 10;



15

wherein,

each of X₁, X₂, X₃, and X₄ is, independently, C₁₋₁₀ alkoxy, or halo;

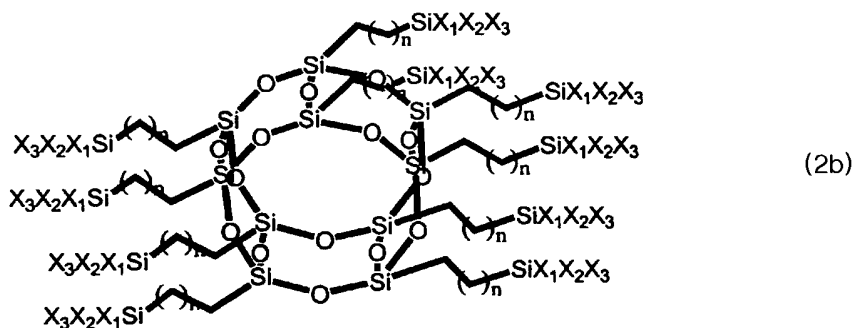
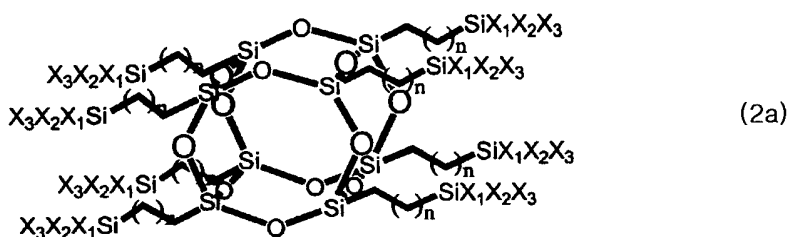


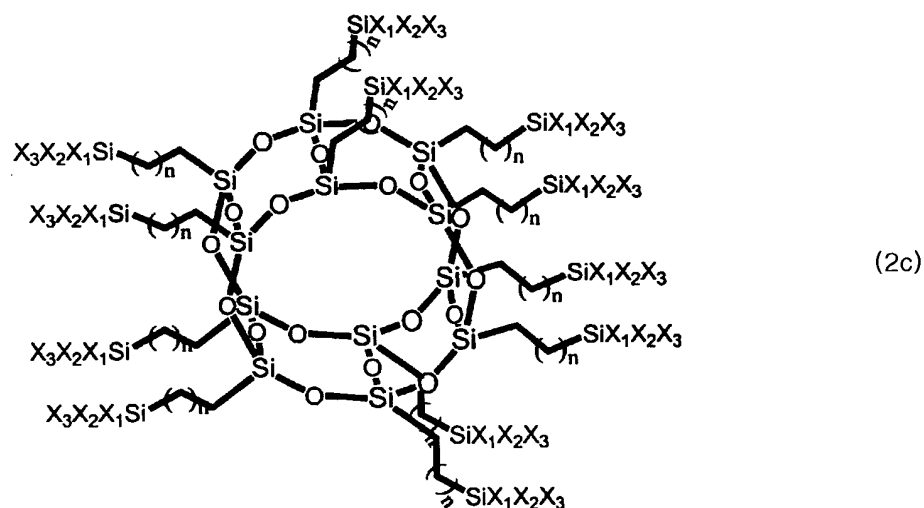
wherein,

- 20 R is H, C₁₋₃ alkyl, C₃₋₁₀ cycloalkyl, or C₆₋₁₅ aryl; and

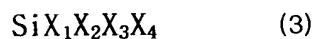
each of X_1 , X_2 , and X_3 is, independently, C_{1-3} alkyl, C_{1-10} alkoxy, or halo, provided that at least one is alkoxy or halo.

2. The siloxane-based resin according to claim 1, wherein the resin is prepared by hydrolyzing and polycondensing a cage-shape siloxane compound of any of formulas (2a) through (2c), together with a silane compound of formula (3) and/or a silane compound of formula (4), in an organic solvent in the presence of a catalyst and water:

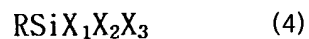




in the above formulas (2a) through (2c),
each of X_1 , X_2 , and X_3 is, independently, C_{1-3} alkyl, C_{1-10} alkoxy, or halo,
provided that at least one is alkoxy or halo; and
5 n is an integer from 1 to 12;



wherein,
each of X_1 , X_2 , X_3 , and X_4 is, independently, C_{1-10} alkoxy, or halo;



10 wherein,
R is H, C_{1-3} alkyl, C_{3-10} cycloalkyl, or C_{6-15} aryl; and
each of X_1 , X_2 , and X_3 is, independently, C_{1-3} alkyl, C_{1-10} alkoxy, or halo,
provided that at least one is alkoxy or halo.